DISCUSSION

This study quantifies the diagnostic performance of radiographic findings in the diagnosis of acute CHF in consecutive patients presenting with acute dyspnoea to the emergency department. Acute CHF requires active treatment and therefore accurate diagnosis. Overall, radiographic CHF signs were specific but only moderately sensitive in the diagnosis of CHF. This finding has important implications for clinical practice. The presence of any of the signs of acute pulmonary congestion reliably indicates acute CHF. Their absence, however, in no way excludes acute CHF. Interestingly, radiographic interpretation regarding the presence or absence of CHF was accurate in only 69% of patients. Our results are supported by data from the breathing not properly study.[2] Knudsen and colleagues[2] showed that alveolar oedema, interstitial oedema, and cephalisation all had a specificity $> 90\%$ for CHF but that only cardiomegaly had a sensitivity $> 50\%$.

Our study has three particular strengths. Firstly, it included a large contemporary cohort of consecutive patients presenting with acute dyspnoea. Changes in causes in recent years and specific limitations associated with respiratory distress resulting in suboptimal positioning and single plan supine imaging in many patients make our data particularly important.[3] Secondly, the study population was highly representative of the elderly population of patients with acute dyspnoea in clinical practice.[1 2] These patients have extensive co-morbidity. As early as 35 years ago, pulmonary co-morbidity was noted to influence the radiographic appearance of pulmonary venous hypertension. Thirdly, this was the first study in which B-type natriuretic peptide concentrations could be considered for a considerable number of patients in the standard definition of CHF.[1 2]

Our study has several limitations. Firstly, not all patients could be examined in the standing position and no standardised criteria for the radiographic signs of pulmonary venous hypertension were used. Moreover, the chest radiographs were not evaluated by core laboratory. Although this may have led to an underestimation of the diagnostic accuracy of the chest radiographs, the study very well reflects the ''real world'' diagnostic performance. Our approach may have significantly reduced the bias of previous studies in which the radiologist specifically evaluated the chest radiograph for the presence of CHF. Secondly, the chest radiograph beyond doubt did confound the final discharge diagnosis. This may have led to an overestimation of the diagnostic accuracy of the chest radiographs. This effect should have been smaller than in previous studies, however, because for logistical reasons the radiological report was not available to the physicians in the emergency department but became available only on the ward.[2] Thirdly, only 101 patients underwent echocardiography. Therefore, we cannot in all patients differentiate between systolic and diastolic CHF.

In conclusion, chest radiography is only moderately accurate in the diagnosis of CHF in contemporary patients presenting with acute dyspnoea to the emergency department. Radiographic findings of CHF are specific but only moderately sensitive.

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The study was carried out according to the principles of the Declaration of Helsinki and approved by our local ethical committee.

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